Section 1 – Quick start guide

Pest snails in Australia

Introduced Mediterranean snails are major pests of grain crops and pastures in Australia. The following two round-shaped and two conical-shaped species are the focus of this manual:

- **Round snails:**
  - Vineyard snail, *Cernuella virgata*
  - White Italian snail, *Theba pisana*
- **Conical snails:**
  - Conical snail, *Cochlicella acuta*
  - Small pointed snail, *Cochlicella barbara*

These species feed on crops and contaminate grain at harvest. All four species share many biological characteristics, but vary in their abundance and pest status in different cropping regions. There is no single solution for snail control. An integrated management program is required, which targets key stages in the snail life cycle (Table 1.2, Figure 1.1 and Figure 1.2).

How to use this manual

This manual contains seven sections:

- **Section 1** – Quick start guide
- **Section 2** – Biology and ecology of pest snails
- **Section 3** – Monitoring
- **Section 4** – Molluscicide baiting
- **Section 5** – Physical controls
- **Section 6** – Harvest and post-harvest control
- **Section 7** – Biocontrol of conical snails

To use this manual, keep the **Quick start guide (Section 1)** handy and follow the **Key actions (Table 1.2)**. For more details, refer to **Sections 2 to 7** (Pages 10–34) and follow the **Key actions**.

Table 1.1: Identification of the four pest snail species covered in this manual.

Round snails		Conical snails	
Vineyard snail, *Cernuella virgata* • Open circular umbilicus (central depression) • Feeds on plants and dead plant matter • Can damage crops and contaminate grain		**Conical snail, *Cochlicella acuta*** • Elongated shell (ratio of length to maximum diameter greater than 2:1) • Feeds primarily on dead plant matter, but sometimes on plants • Can contaminate grain	
White Italian snail, *Theba pisana* • Partly closed umbilicus (not circular) • Feeds on plants and dead plant matter • Can damage crops and contaminate grain		**Small pointed snail, *Cochlicella barbara*** • Broader shell (ratio of length to maximum diameter less than 2:1) • Feeds on plants and dead plant matter • Can contaminate grain • Pest of lucerne	

Images: Herbert Zell

Core management actions for pest snails

- Monitor snails at key times of year (Section 3, and Figure 1.1) and assess management options (Figure 1.2).
- Manage snails in all infested crop and pasture paddocks in all years (Table 1.2).
- Practise farm biosecurity (Section 6) to prevent snails spreading between paddocks and farms.

Table 1.2: Key actions and considerations for snail management.

Management practices	Considerations
1. Practise farm biosecurity to avoid spreading snails (Section 6)	
Ensure vehicles and equipment are free from snails, especially at harvest, in summer and at planting	• Snails dislodged in summer readily climb onto equipment
Do not move infested fodder	• If snail removal is difficult: consider harvesting snail-infested areas last, then thoroughly clean equipment
Limit access to farm	• Erect farm biosecurity signage at all entries • Ensure contractors do not bring infested machines onto property
2. Reduce snail survival over summer (Section 5)	
Control summer weeds	• Removing weedy refuges limits snail survival and increases the efficacy of cabling and burning
Use cables or chains to dislodge snails from stubble on hot days and kill them	• Cable on sunny days with maximum temperature more than 35°C • Using two passes at least one hour apart is most effective • May be less effective against conical snails
Use rollers to flatten stubble and crush snails	• Heavy flat steel rollers are more effective than rubber-tyred or steel-ribbed rollers • Roll in summer or autumn when snails are resting on stalks • May be less effective against conical snails
Consider burning to manage excessive stubble and kill snails	• Kill weeds; roll stubble and turn over rocks prior to burning • A slow, hot, even burn kills most snails • Consider soil health and erosion risk
3. Bait before egg-laying to suppress snails (Section 4)	
Apply baits as soon as snails commence feeding at the end of summer dormancy	• Monitor movement in late summer and autumn • Apply bait as soon as snails commence feeding • Monitor and re-apply bait as required • Apply bait evenly at recommended rate • If both round and conical snails are present: consider a second bait application around sowing time due to later onset of conical snail activity
4. Minimise snail contamination at harvest (Section 6)	
Harvest early	• Snails are more easily dislodged earlier in spring
Consider windrowing or direct heading	• Windrowing dislodges mostly larger round snails; can reduce snail intake when harvested soon after • Direct heading canola may reduce the intake of conical snails
Harvest and store snail-infested grain separately from cleaner grain	• Use separate storages for post-harvest cleaning
5. Clean infested grain after harvest (Section 6)	
Clean infested grain using a combination of snail crushing rollers, screening and scalping	• Tailor cleaning systems to your individual farm situation to maximise snail/grain separation and minimise grain loss • Calculate the cost and benefits of different solutions to clean snails from grain • Storing grain for at least one week can increase cleaning throughput
6. Encourage biocontrol of conical snails (Section 7)	
In regions where the fly is established: Promote flowering native vegetation on property perimeters to enhance biocontrol	• The parasitoid fly, *Sarcophaga villeneuveana*, attacks both conical and small pointed snails, but also requires floral nectar and pollen resources

Figure 1.1: Snail life cycle and key monitoring times.

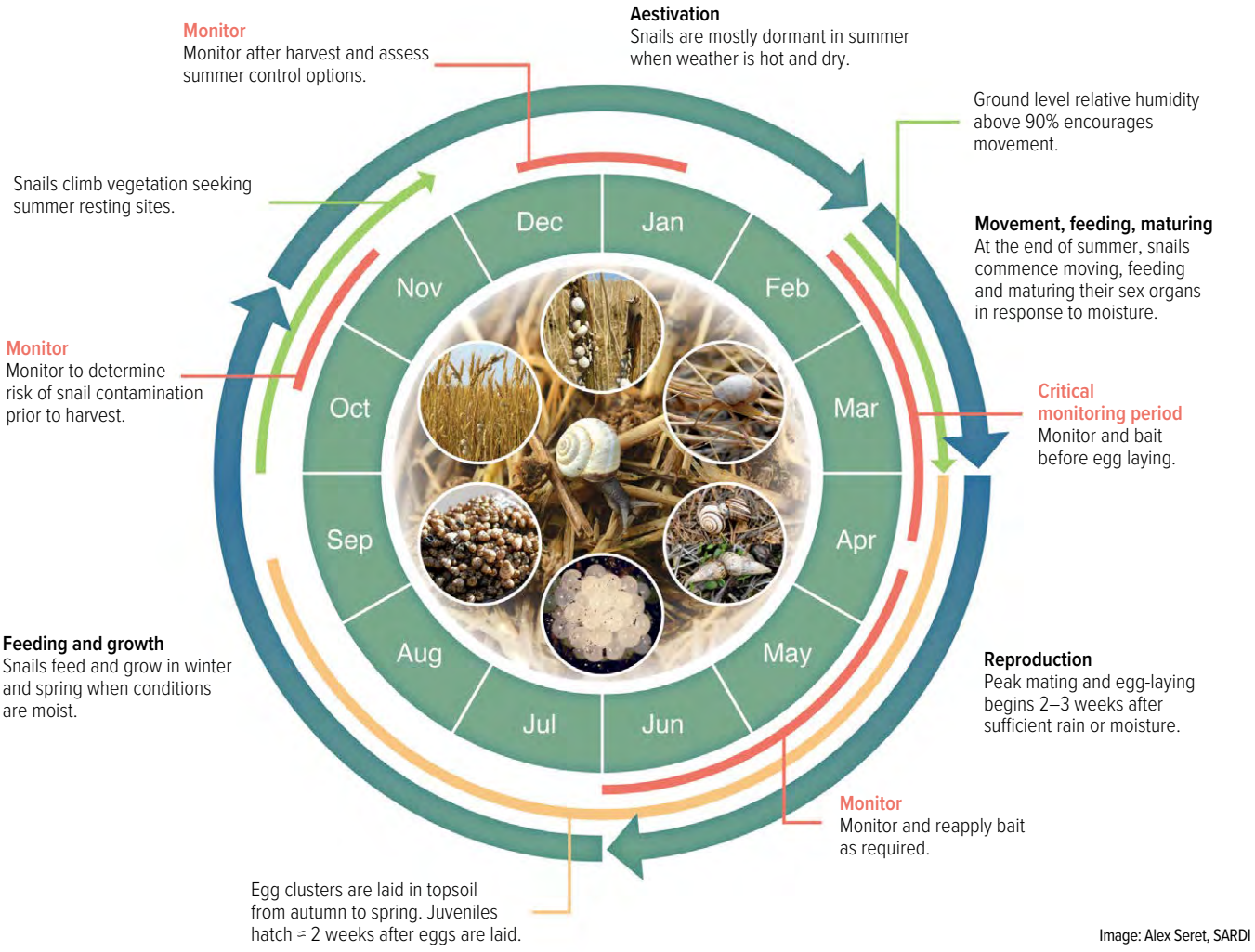

Image: Alex Seret, SARDI

Figure 1.2: Snail management timeline.

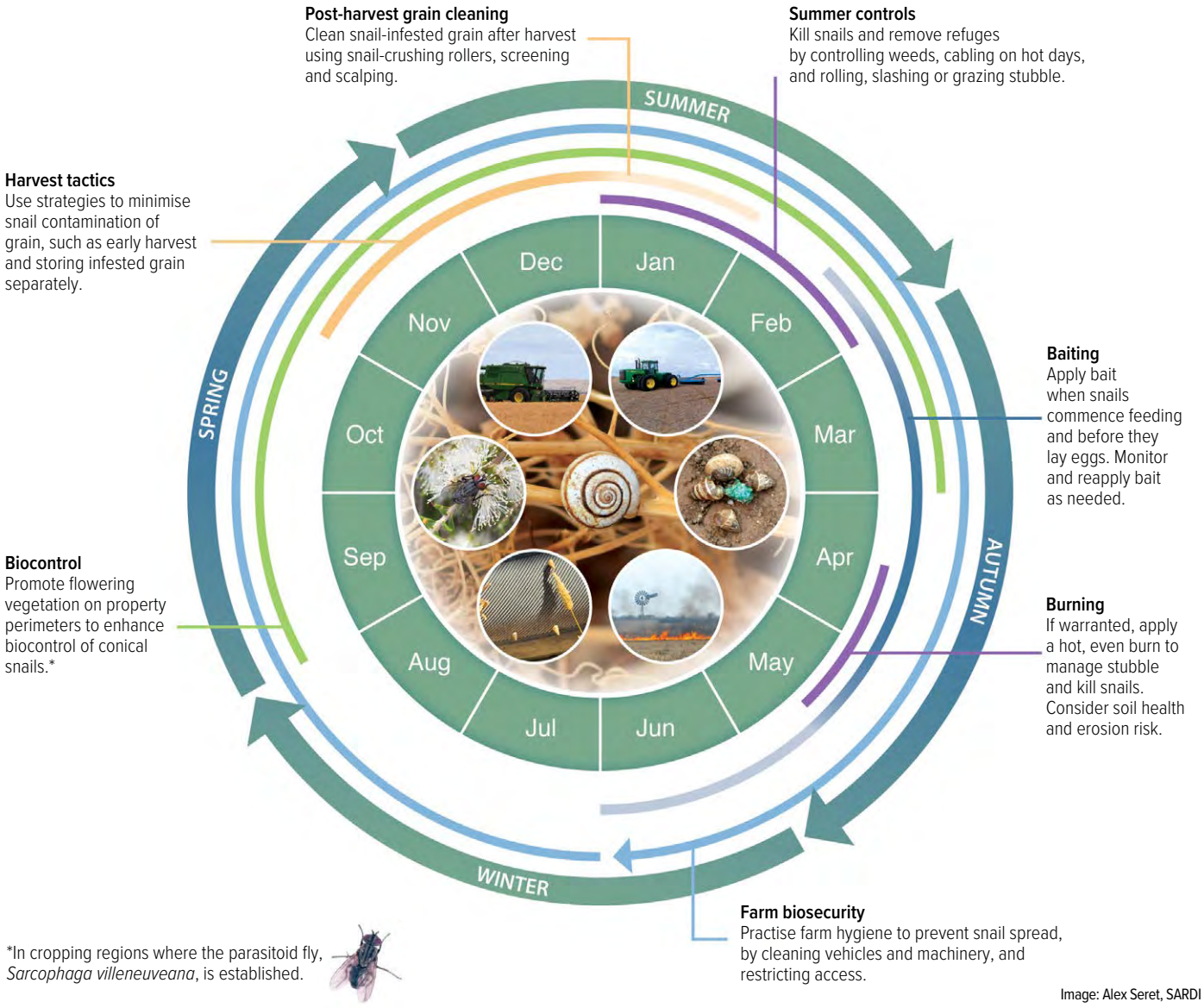

Image: Alex Seret, SARDI